

**327 IAC 8-13-10 Operation and Maintenance of Treatment Unit**

**Authority:**

**Affected:**

**Sec. 10 (a) Filtration requirements are as follows:**

**(1) The continued application of any type of filtration shall be supported by water quality data representing a period of time adequate to characterize the variations in water quality.**

**(2) Pilot or full scale treatment studies may be required to demonstrate the applicability of changes to the method of filtration.**

**(3) The department may require periodic treatment of filter material for control of bacterial and other growth.**

**(4) All filters shall have an easily readable meter or rate of flow indicator on each battery of filters.**

**(5) Requirements for rapid rate gravity filters are as follows:**

**(A) Filter redundancies shall be provided and operationally maintained.**

**(B) Filter material shall meet Recommended Standards for Water Works or other standards approved by the department upon demonstration of the ability to meet water quality standards.**

**(C) Backwashing facilities shall be designed and maintained to provide:**

**(i) A minimum rate of fifteen (15) gallons per minute per square foot, consistent with water temperatures and specific gravity of the filter media unless otherwise specified by the commissioner.**

**(ii) A reduced rate of ten (10) gallons per minute per square foot may be acceptable for full depth anthracite or granular activated carbon filters.**

**(iii) A reduced rate of backwashing during air scouring is acceptable.**

**(iv) Backwashing must be done with water that will not cause risk of an MCL or increase the health risk to the public at the required rate from backwash tanks, a backwash pump from a reservoir or a high service main, other filter units, ground water, or a combination of these.**

**(v) Redundant backwash pumps shall be maintained unless an alternate means of obtaining washwater is available.**

**(vi) A system shall be capable of backwashing each cell for no less than fifteen (15) minutes at the design rate of backwash.**

**(vii) A minimum of one (1) backwash regulator or valve on the backwash line to obtain the desired rate of filter backwash.**

**(viii) A rate-of-flow indicator on the main backwash line located for convenient reading by the operator during the washing process.**

(ix) Backwashing by a method which prevents rapid changes in the backwash water flow.

(x) A system shall conduct a media integrity inspection, which consists of at a minimum checking for mudballs, channeling, media freeboard, and media condition, once a year.

(6) Rapid rate pressure filter requirements are as follows:

(A) The normal use of these filters is for iron and manganese removal. Pressure filters shall not be used in the filtration of surface water or ground water under the direct influence of surface water or following lime-soda softening unless otherwise approved by the commissioner.

(B) Rate of filtration shall not exceed three (3) gallons per minute per square foot of filter area except where in-plant testing as approved by the agency has demonstrated satisfactory results at a higher rate.

(7) Requirements for backwash wastewater from iron & manganese filters are as follows:

(A) When discharging to a sanitary sewer, a public water system shall meet requirements of 327 IAC 7-5-2 (pretreatment rule ?).

(B) Smooth-end sampling taps shall be provided for control purposes. Taps shall be located on each treatment unit effluent. Testing equipment shall be provided to adequately control the treatment process.

(C) Sand filters, lagoons, and detention tanks that are used to treat backwash wastewater from iron and manganese removal filters shall meet the Recommended Standards for Water Works, Waste and Disposal Section for sand filters, lagoons, and detention tanks.

(D) Refer to 327 IAC 6-1 for requirements for land application of sludge from a water plant.

(b) Aeration treatment devices described in this section may be used for oxidation, separation of gases or for taste and odor control. The following requirements shall be met:

(1) Aeration treatment devices shall be maintained in accordance with Recommended Standards for Water Works.

(2) Provisions shall be made to insure accessibility for maintenance and inspection.

(3) Aeration treatment devices shall be insect-proof and light-proof.

(4) Aeration treatment devices shall have the air intake located above grade and the air introduced into the column passed through insect-tight screen and be as free of dust as possible.

(5) Aeration treatment devices shall be designed to insure that the water outlet is adequately sealed to prevent unwanted loss of air.

(6) The design for natural draft aeration shall provide that water is distributed uniformly over the top tray.

(7) Pressure aeration may be used for oxidation purposes if a pilot plant study or current water data indicates the method's effectiveness. Pressure aeration will not be approved for removal of dissolved gases. Pressure aeration devices shall be designed to meet the following requirements:

- (A) Filters following pressure aeration shall have adequate exhaust devices for release of air.**
- (B) Pressure aeration devices shall be designed to cause a thorough mixing of compressed air with water being treated, and shall provide screened and filtered air, free of obnoxious fumes, dust, dirt and other contaminants.**

**(8) Other methods of aeration may be permitted if their effectiveness is demonstrated and approved by the department. Methods include but are not restricted to spraying, diffused air and mechanical aeration. The treatment processes shall be designed to meet the particular needs of the water to be treated.**

**(9) Requirements for packed column aerators are as follows:**

**(A) Tower requirements for packed column aerators are as follows:**

- (i) The tower shell construction shall be made of material compatible with potable water and shall be resistant to the aggressiveness of the water and dissolved gasses.**
- (ii) A water distribution system shall be provided that distributes the water evenly over the packing.**
- (iii) Adequate packing support shall be provided to prevent packing deformation.**
- (iv) A moisture barrier shall be provided to prevent tower misting and icing.**
- (v) Access manholes shall be provided in the side of the tower for facilitating inspection and replacement of the packing material.**
- (vi) An access ladder with a safety cage shall be provided.**
- (vii) Adequate foundation and lateral support shall be provided to prevent overturning due to wind loads.**
- (viii) A screened, rain proof, outlet for air exhaust shall be provided.**

**(B) Packing requirements for packed column aerators are as follows:**

- (i) The packing material shall be compatible with use of potable water and shall be resistant to the aggressiveness of the water and dissolved gasses.**
- (ii) A method of cleaning the packing shall be provided where iron or manganese could be responsible for fouling the media.**

**(C) Blower requirements for packed column aerators are as follows:**

- (i) The blower shall be provided with a weather-proof motor, a tight housing and an adequate foundation.**
- (ii) The blower inlet shall be provided with an insect screen and a dust filter.**
- (iii) A method for measuring air flow shall be provided.**
- (iv) The blower shall be adequately sized to provide sufficient air to achieve the desired removal rates.**

**(D) Other requirements for packed column aerators are as follows:**

- (i) A means shall be provided to drain the influent riser and the tower upon pump shut down.
- (ii) All buried piping shall be maintained under a positive pressure greater than the elevation of the ground surface.
- (iii) Influent and effluent sampling faucets shall be provided.
- (iv) A meter shall be provided to determine water flow to the tower.
- (v) The water passing through the tower shall be continuously disinfected and provided with a minimum of thirty (30) minutes of contact time.
- (vi) A means of bypassing the tower shall be provided.
- (vii) Air emission controls shall be provided if necessary to meet air quality standards.

(10) Aerated water shall receive disinfection treatment.

(11) Aerators that discharge through the atmosphere shall be protected by being placed in a louvered enclosure designed to provide easy access to the interior.

(12) Aerators that are used for oxidation or removal of dissolved gases from waters that will be given no further treatment other than chlorination shall be protected from contamination from insects and birds and wind borne debris or dust.

(13) Aerators shall be inspected **(HOW OFTEN)** and equipment shall be provided to test for dissolved oxygen (DO), Ph, and temperature to determine proper functioning of the aeration device.

(c) Rapid mix shall mean the rapid dispersion of chemicals throughout the water to be treated, usually by violent agitation. Requirements for rapid mix shall meet the following:

(1) Basins shall be equipped with mechanical mixing devices unless other methods, such as baffling, or injection of chemicals at a point of high velocity, are approved by the agency after determining that the other requirements of this section will be met. Variable speed drive equipment is recommended.

(2) The detention period for mechanical mixing shall be as short as possible depending upon the velocity gradient provided by the mixing units.

(3) The rapid mix and flocculation basin shall be as close together as possible.

(4) A rapid mix device or chamber ahead of the solids contact unit may be required by the agency.

(5) Duplicate units for rapid mix, flocculation and sedimentation need not be provided unless the treatment process units will be taken out of service for more than one day at a time for maintenance.

(d) Clearwell requirements are as follows:

(1) Clearwell storage shall be sized, in conjunction with distribution system storage, to relieve the filters from the strain of fluctuations in water use or peak demands.

(2) When finished water storage is used to provide proper contact time for disinfection, documentation shall be provided to assure adequate detention time under all operating conditions. The installation of baffle walls or

additional reservoir capacity may be required where necessary to prevent short circuiting and to obtain adequate contact times.

(3) At plants treating groundwater, a provision shall be made for applying chlorine to the raw water and the clearwell inlet or the high-lift pump discharge piping.

(4) Residual levels of total chlorine shall be maintained at least at one (1) milligram per liter.

(e) Electrical (Black boxes) main switch gear electrical controls shall be located above grade, in areas not subject to flooding.

(f) Requirements for taking treatment units off line and placing treatment units back on line are as follows:

(1) The agency shall be notified by the public water supply official as to the nature of the facility being taken off line and when they expect to be back on line.

(2) Newly constructed or repaired water distribution mains, treatment units and finished water storage facilities shall be flushed and disinfected before use in accordance with methods acceptable to the agency.

(3) Samples will be taken to determine the adequacy of disinfection following line installation, replacement, or repair.

(4) Water samples shall also be required for the determination of the adequacy of the source, storage, treatment or distribution of water to the public. The amount of samples that are required shall be determined by the agency.

(g) Separation distance between chemical feeds? (Ask workgroup)

(h) Residual management requirements are as follows:

(1) Facilities for disposal of sludge are required by the agency. The sludge removal design shall provide for the following:

(A) Sludge pipes not less than three (3) inches in diameter and so arranged as to facilitate cleaning.

(B) Entrance to sludge withdrawal piping to prevent clogging.

(C) Valves located outside the tank for accessibility.

(D) Provisions for the operator to observe and sample sludge being withdrawn from the unit.

(E) Sludge disposal sections 327 IAC 6-1 contain additional specific requirements for sludge disposal. Flushing lines or hydrants shall be provided to back flush sludge lines and basins or for other purposes. Protection shall be provided for all potable water lines used if potable water could become contaminated by nonpotable water.

## **(2) Suggestions from workgroup**

(i) General requirements for maintaining treatment units are as follows:

(1) A person shall maintain the treatment unit so that it is capable of performing its original intended function.

(2) A person shall make any necessary repairs to the treatment unit in order to maintain its operation.

(3) A person shall not change the design of a treatment unit without first receiving approval of the commissioner.